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CHAPTER TWENTY-SIX

SURVEY TRANSMITTALS

Transmitting accurate and consistently-formatted survey data to the designer will facilitate an efficient and economical project design. Regardless of the survey method (i.e., electronic or conventional), the electronic survey file that is submitted to INDOT must be in a MOSS format that is consistent with the Department's string label convention. If the survey is for a consultant's CADD system, the files may be transmitted in a DXF format. A complete survey transmittal should incorporate all relevant survey information, whether electronic or not.

This chapter provides the style and format of a survey transmittal that is acceptable to the Department. The guidelines and procedures described herein also include the types of files and the documentation formats that should be utilized in project design.

26-1.0 GUIDELINES AND PROCEDURES

26-1.01 Conventional Engineering Survey Data

Although a conventional engineering survey is permitted by the Department, the survey data must be transmitted to INDOT as an electronic file in a MOSS format that is consistent with the Department's string label convention. Depending on the software, it may be necessary to concatenate strings to ensure that a particular feature is continuous.

The original survey field notes must be submitted to the Department. Standard field notes should be submitted in a standard survey field book.

26-1.02 Electronic Collection Survey Data

Many different types of formats exist for the data collected by an electronic survey. The following discusses the formats that are acceptable for use for an INDOT project and the circumstances under which each may be utilized.

26-1.02(01) MOSS Format

If electronic survey data is collected by the Department or collected by others and transmitted to the Department for use by INDOT design personnel, the electronic data must satisfy one of the following MOSS file formats.

1. GENIO File Format. The GENIO (i.e., general input/output) format is based on an ASCII (i.e., text) file that includes a specific number and type of data fields. Most existing survey and CADD software packages have the ability to accommodate this file format. A GENIO file can be directly input into MOSS without difficulty.
2. Model File Format. The model file format is a binary file format that can be directly input into MOSS without conversion. The MOSS model file format is preferred by the Department.

26-1.02(02) DXF Format

The DXF (i.e., data exchange) format is an industry-standard data interchange format that can be utilized with most of the existing CADD systems. The DXF file format is used by consultants that cannot accommodate the MOSS file format. The following DXF files are necessary for project design.

1. Topography File. All planimetric information that is layered according to the Department's string label convention is contained in the DXF topography file.
2. Contour File. The DXF contour file includes the survey data at 0.5-ft contour intervals. Predominant contours are identified at 5-ft intervals.
3. Triangulation File. This consists of a listing of the strings or layers not to be used in triangulation of the ground model.

26-1.03 Other Survey Information

A complete survey transmittal includes other survey information that is relevant to the project. This is described below.

1. Survey-Envelope Contents. The survey envelope should be a 9-in. x 12-in. manila envelope. It should include the interview sheets and section plats. All other information should be packaged in a separate envelope and submitted with the completed survey.

Figure 26-1A, Survey-Envelope Label, illustrates how the survey envelope should be labeled. The outside of the survey envelope should include the following:

- a. route number and location description as it appears on the schedule sheet;
 - b. designation number;
 - c. project number;
 - d. structure number, if applicable;
 - e. county;
 - f. date;
 - g. survey-party personnel; and
 - h. envelope contents.
2. Survey Field Books. The survey field books should be submitted with the final survey materials.
 3. Miscellaneous Envelope. See Figure 26-1B, Miscellaneous Envelope. The miscellaneous envelope should be placed in the back of the survey book and should include the following:
 - a. copies of section plats;
 - b. photographs; and
 - c. section-corner reference cards (see Figure 26-1C).
 4. Property Deeds. Property deeds that are within the survey limits and those deeds which appear necessary for other reasons should be acquired by the survey party. Property deeds should be submitted with the field survey and forwarded to the Office of Real Estate.
 5. Subdivision Plat. A subdivision plat should be placed in an envelope that is submitted to the Department. See Section 26-1.03, Item 1.
 6. Town Plat. A town plat should be placed in an envelope and submitted to the Department. See Section 26-1.03, Item 1.
 7. Route Plat. A route plat is required for an INDOT project that requires the purchase of right of way. This is in accordance with the Standards for Surveying in Indiana (Rule 12) as promulgated by Indiana Administrative Code 865. A copy of the route plat is required for the use by the Office of Real Estate. It should be submitted on an A1 size, 33 in. x 23 in., mylar sheet (see Section 14-3.03) and should already have been recorded if the survey is conducted by a consultant. If the survey is conducted by INDOT, the route plat will be transmitted to the Office of Real Estate for recording. See Figure 26-1E, Location-Control Route-Survey Plat Example. The following guidelines are intended to aid in developing a route plat to satisfy IAC 865, but are not intended to replace the surveyor's judgement as to what should appear in the survey.

- a. The route plat should be reduced to an A3, 17 in. x 11 in., size (see Section 14-3.03) for recording. The reduction should be considered in choosing font sizes and line thickness for the original-sized version. Include a .DXF electronic file on diskette for submission.
- b. Indicate the scale and a graphical representation. INDOT uses a 1:2500 relative scale. This produces a single plat that enables sufficient space to include the surveyor's report for a project of about 2500 ft in length.
- c. Indicate the location of the project by identifying the roads on the plat. If no intersecting roads are within the project limits, include a description for the location in the surveyor's report.
- d. Identify the units used on the plat. If units are not identified, the assumed system will be english. A dimension including a decimal point will be assumed to be feet.
- e. Show all edges of pavement, fences, centerline points found or set, approximate locations of apparent property lines, buildings, etc. INDOT uses a separate plat for the field and office plat. For the field plat, showing the right of way is not required. Only physical evidence of right of way is shown. The property lines shown on the field plat are for graphical representation only. They are not intended for a property retracement and are not to scale.
- f. Indicate all centerline points and reference baseline points set. The stationing used on the centerline should be shown and the basis of the stationing indicated in the surveyor's report. Section corners should also be graphically indicated on the plat where feasible due to scale considerations. All points should have references drawn according to the type of monument (e.g., centerline, section corner, subdivision corner, property corner). The arrow for a centerline point indicates the direction of the alignment. For a section corner, the arrow indicates the direction for north. This should be shown in the reference boxes. See Figure 26-1E, Location-Control Route-Survey Plat Example.
- g. Indicate as to whether the monument was found or set, and include a complete description in the surveyor's report. This should include the size, type of monument, vertical description (e.g., flush, buried, protruding), location to physical features around the monument, origin (if known), uncertainty, etc.
- h. The location of the monument can be identified with an angle and distance, station and offset, or a coordinate system. Coordinates should be reproducible

with the information shown on the plat. Include all necessary information so that this may be accomplished. INDOT uses an assumed coordinate system for its plats. Coordinates are provided in the reference boxes to tie monuments to the coordinated system on the plat. This is the preferred method.

- i. Show the property owners' names on the plat at the time of the survey.
 - j. Include all title-block information known at the time the plat is transmitted to the Office of Real Estate.
8. Recorded Plats. The recorded surveys that were obtained from the recorder's office should be submitted with the survey.
 9. Plans. Copies of plans that have been obtained from the Central Office, district office, or other sources should also be submitted to the Department.
 10. Computer Diskettes. Computer diskettes should be included in the miscellaneous envelope. Figure 26-1D, Computer-Diskette Label, illustrates an example of how to label each diskette. A labeling program should be used to make the label. Do not submit a hand-written label. The text on the label should be in the arial font with a point size of 10. The orientation of the label should be as shown in Figure 26-1D.

U.S. 231 - BRIDGE OVER FIRST CREEK, 4.0 mi SOUTH OF S.R. 558
DES. NO. 8017990
PROJECT NO. F-075-6(008)
STRUCTURE NO. 231-14-3524 (OLD), 231-14-7332 (NEW)
DAVISS COUNTY
AUGUST 1994
SURVEY CREW #4 (R. C. HOWELL)

ENVELOPE CONTAINS

1. SECTION PLATS
2. SURVEY NOTICES

SURVEY ENVELOPE LABEL

Figure 26-1A

MISCELLANEOUS	ENVELOPE
1 SECTION	PLAT
5 SECTION CORNER	REFERENCE CARDS
12 PHOTOGRAPHS	
DES. NO. 8017990	US 231

MISCELLANEOUS ENVELOPE

Figure 26-1B

SECTION _____, TOWNSHIP _____, RANGE _____
(Description of Corner Location) _____
_____ COUNTY, INDIANA



TYPE OF MON.: _____
DEPTH: _____
UNCERTAINTY: _____
BY: _____
DATE: _____
DES. NO.: _____

State Form 40180

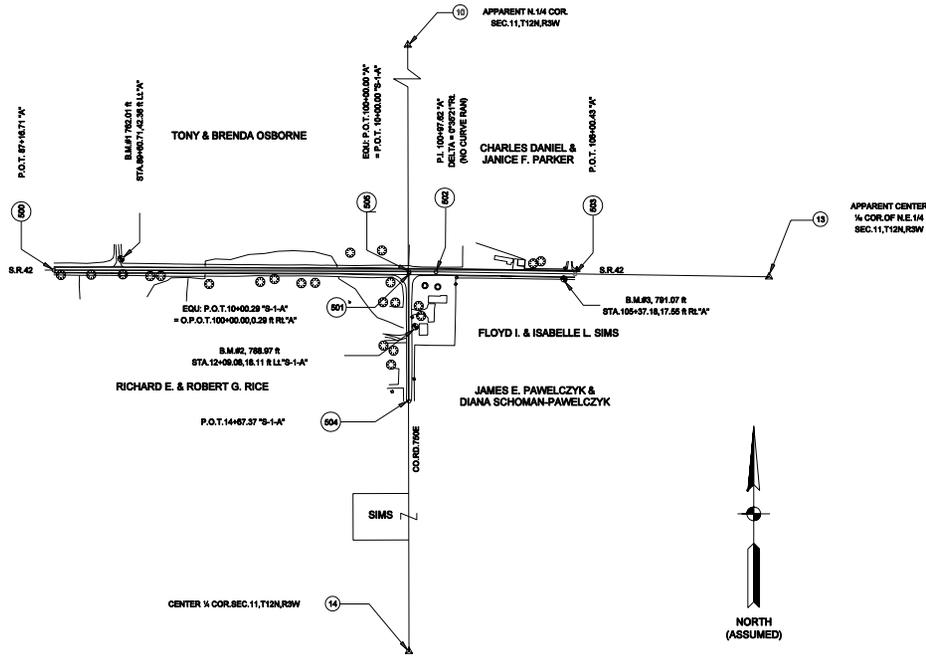
SECTION CORNER REFERENCE CARD

Figure 26-1C

<input type="checkbox"/>	S.R. # 61	8068470	<input type="checkbox"/>
<hr/>			
Str. # 61-42-6475, Bridge Replacement over Branch Deshee River 1.16 km North of S.R. 241 Knox County			
Survey Started 08/18/92 Survey Completed 09/23/92 Disk 1 of 1			
<input type="checkbox"/>		<input type="checkbox"/>	

COMPUTER DISKETTE LABELS

Figure 26-1D



SURVEYORS REPORT
 FOR
 ROUTE SURVEY-INDOT PROJECT NO. STP3267(3) PAGE 1 OF 1
 DES # 9607380 DATE SEPT. 17, 1987

GENERAL:
 - ALL MONUMENT REFERENCE TIES ARE SHOWN ON THE ROUTE SURVEY PLAT.
 - SHOULD ADDITIONAL USPLS CORNERS BE NEEDED WHERE NONE WERE FOUND, THEY SHOULD BE REESTABLISHED AND TIED INTO THIS SURVEY.
 - ITEM NUMBERS ARE ACTUAL FIELD SURVEY POINT NUMBERS USED FOR CONTROL AND TOPOGRAPHY.

ALIGNMENT WAS ESTABLISHED BY CENTERING ON THE PAVEMENT AT THE TOP OF THE HILL JUST EAST OF CO.RD.750E AND USING A BRASS PLUG IN A STEEL POT ¼ MILE EAST OF CO.RD.750E, SAID POINT BEING A ¼ SECTION CORNER. SAID POINT ON HILL DESIGNATED AS A P.I. IN ORDER TO KEEP ALIGNMENT IN THE C.L. OF THE ROAD TO THE WEST. NO CURVE WAS RAN.

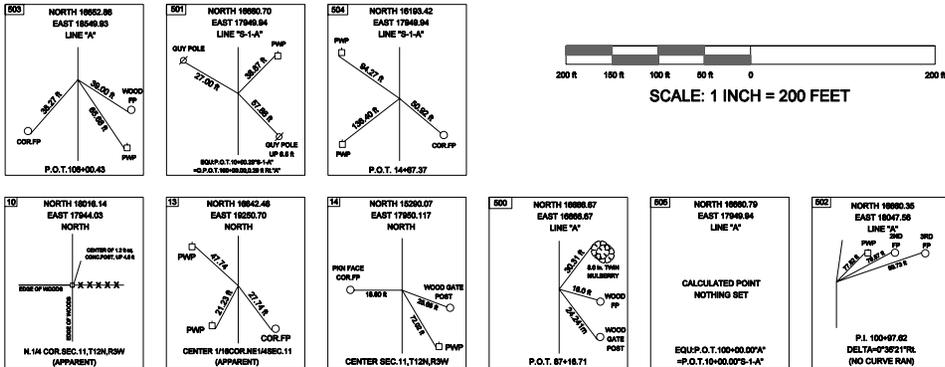
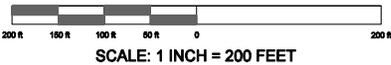
STATIONING WAS DETERMINED BY USING THE FIELD REPORT ON THIS PROJECT, CALLING THE INTERSECTION OF S.R.42 AND CO.RD.760E AS STA 1+000.000 ON LINE "A" AND STA 10+000.000 ON LINE "S-1-A" WHICH RUNS SOUTH. THERE ARE NO PLANS AVAILABLE FOR THIS PROJECT.

LEVEL DATUM IS ON NAVD 88 DATUM USING "8HC PUTN C-1" WHICH WAS INCLUDED IN AN NGS SECOND ORDER CLASS 0 DIFFERENTIAL LEVEL RUN BY NGS IN 1946 AND HAS THE PID #KA0480. SAID BENCH MARK IS IN SW ABUTMENT OF STRUCTURE OVER MILL CREEK WEST OF PROJECT.

THE PURPOSE OF THIS SURVEY IS TO INCREASE THE INTERSECTION SIGHT DISTANCE AT S.R.42 AND CO.RD.750E, A T-INTERSECTION. FOR MORE DETAIL INFORMATION SEE THE ENGINEER'S REPORT FOR DES.#9607380, PROJECT #STP-3267(3).

THIS DATA COLLECTION SURVEY IS FOR THE PURPOSE OF DESIGNING A HIGHWAY IMPROVEMENT PROJECT. IT IS NOT A PROPERTY RETRACEMENT SURVEY. WHERE APPARENT PROPERTY LINES, CORNERS, SUBDIVISION, OR SECTION CORNER INFORMATION IS SHOWN, IT IS BASED ON PHYSICAL EVIDENCE OR TESTIMONY AND VERY LITTLE DEED ANALYSIS WAS DONE.

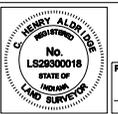
- 10. USED THE TOP CENTER OF A 1.2 R X 1.2 R CONCRETE FENCE POST, 4.0 R HIGH FOUND AT THE APPARENT NORTH ¼ CORNER OF SEC. 11, T12N, R3W. POST HAS MARKINGS ON TOP, BUT UNABLE TO READ. NO RECENT RECORDS OF THIS CORNER WITH THE COUNTY SURVEYOR. UNCERTAINTY IS ESTIMATED TO BE +/- 10 E.
- 13. FOUND BRASS PLUG IN A STEEL POT AT THE APPARENT CENTER ¼ CORNER OF THE N.E. ¼ OF SEC. 11, T12N, R3W, LOCATED IN THE C.L. OF S.R.42 AND CO.RD.775E. ACCORDING TO THE PUTNAM CO. SURVEYOR'S OFFICE, THESE STEEL POTS WERE PLACED WHEREVER AN EXISTING MONUMENT WAS FOUND WHEN THE RD. WAS REPAVED A FEW YEARS AGO AND IS AN APPARENT PERPETUATION OF THE CORNER. CORNER UNCERTAINTY IS NEGLIGIBLE.
- 14. FOUND IRON PIN WITH A YELLOW PLASTIC CAP STAMPED: "ROSS HOLLOWAY RLS 50530" AT THE CENTER OF SEC. 11, T12N, R3W, IN THE C.L. OF CO.RD.750E, AS PER INFORMATION OBTAINED FROM THE CO. SURVEYOR'S OFFICE. CORNER UNCERTAINTY IS NEGLIGIBLE.
- 500. SET PK NAIL FLUSH IN THE CENTER OF THE PAVEMENT. ORIGINAL MONUMENT, THEREFORE THERE IS NO UNCERTAINTY.
- 505. CALCULATED POINT FOR CENTERLINE INTERSECTION. NO MONUMENT SET.
- 502. SET PK NAIL FLUSH IN THE CENTER OF THE PAVEMENT. ORIGINAL MONUMENT, THEREFORE THERE IS NO UNCERTAINTY.
- 503. SET PK NAIL FLUSH ON LINE BETWEEN #502 AND #13. ORIGINAL MONUMENT, THEREFORE THERE IS NO UNCERTAINTY.
- 501. SET PK NAIL FLUSH ON LINE "S-1-A", MISSING LINE "A" BY 0.022m. ORIGINAL MONUMENT. THEREFORE THERE IS NO UNCERTAINTY.
- 504. SET PK NAIL FLUSH IN THE CENTER OF THE PAVEMENT. ORIGINAL MONUMENT, THEREFORE THERE IS NO UNCERTAINTY.



SURVEY STARTED	
7-7-87	
SURVEY COMPLETED	
7-15-87	
ROUTE PLAT SHEETS	
1	of 1

FIELD SURVEYOR STATEMENT

THIS SURVEY, TO THE BEST OF MY KNOWLEDGE AND BELIEF, IS EXECUTED ACCORDING TO THE PROVISIONS OF 886 I.A.C. 1-10-26 REGARDING ROUTE SURVEYS. EXCEPT THAT ANY DATA SHOWN REGARDING THE LOCATION OR DESCRIPTION OF THE EXISTING PARCELS IS NOT PART OF THIS SURVEY.



RECOMMENDED FOR APPROVAL

REGISTERED LAND SURVEYOR, FIELD DATE

INDIANA
 DEPARTMENT OF TRANSPORTATION

LOCATION CONTROL ROUTE SURVEY

HORIZONTAL SCALE	BRIDGE FILE
1:2500	
COUNTY	DESIGNATION
PUTNAM	9607380
SURVEY BOOK	PLAN SHEETS
	1 of 1
CONTRACT	PROJECT
	STP3267(3)

LOCATION CONTROL ROUTE SURVEY PLAT EXAMPLE
 Figure 26-1E